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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,880	11/12/2003	Shuibo Xie	1856-40401 (9948.0-02)	7375

31889 7590 02/08/2006

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EXAMINER
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WARTALOWICZ, PAUL A

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 02/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/706,880

Applicant(s)

XIE ET AL.

Examiner

Paul A. Wartalowicz

Art Unit

1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11/12/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 07/15/04, 02/06/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 5-11, 16, 17, and 19-22, and 27-28 are rejected under 35

U.S.C. 102(e) as being anticipated by Feeley et al. (U.S. 6447745).

Feeley et al. teach a process for the catalytic oxidation of hydrocarbons and Fischer-Tropsch synthesis process (synthesis of C<sub>10+</sub> hydrocarbons, col. 18, lines 1-5) (col. 1, lines 4-17) in the presence of a catalyst (col. 4, lines 30-35) wherein the catalyst comprises an alumina support (col. 6, lines 9-12) and a catalytically active metal selected from rhodium and iridium (col. 5, lines 55-61) and Lanthanum acting as a modifier to stabilize the support surface area (col. 10, lines 27-34) wherein the alumina and modifier are calcined at a temperature of 1200°C (col. 18, lines 40-55) and wherein the process of hydrocarbon conversion is operated at from one atmosphere or more (col. 12, lines 56-62).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1754

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hindin et al. (U.S. 3956188) in view of <sup>and</sup> ~~and~~ Anumakonda et al. (U.S. 6221280) Isogaya et al. (U.S. 4331451).

Hindin et al. teach a process for preparing a catalyst composition (col. 1, lines 5-9) wherein the catalyst comprises a composite of alumina (alumina support, col. 1, lines 42-45), a rare earth metal oxide (lanthanum, cerium, samarium, praseodymium, col. 1, lines 42-45; col. 4, lines 38-45) and a platinum group metal (ruthenium, rhodium, iridium, and their corresponding alloys, col. 4, lines 66-68; col. 5, lines 1-8) characterized by a surface area of at least 20 square meters per gram after calcination at a temperature of 1200°C (col. 1, lines 42-45) wherein the afore mentioned catalysts are particularly useful when employed with high temperature oxidation of carbonaceous fuels (col. 12, lines 1-4). Hindin et al. fail to teach a process for producing synthesis gas comprising passing a hydrocarbon gas and an oxygen containing gas over a catalyst, under conditions effective to produce a gas stream comprising hydrogen and

carbon monoxide and wherein the catalyst comprises a metal surface area greater than  $0.35 \text{ m}^2/\text{g}$  of the catalyst. Hindin et al. also fail to teach wherein the process exhibits a hydrocarbon conversion equal to or greater than 80% or 85%, and a hydrogen selectivity to or greater than 80% or 85%, and a hydrogen selectivity equal to or greater than 80%, wherein the process exhibits a loss in hydrogen selectivity no greater than about 1 or 3% per day, under operating conditions of at least greater than or equal to 2 atmospheres.

Anumakonda et al., however, teach a catalyst comprising an alumina support (col. 8, lines 20-23) and a noble metal impregnated therewith (rhodium and iridium, col. 8, lines 10-15) wherein weight percentage or metal loading of the catalyst is about 20 wt % (col. 8, lines 18-19) for the purpose of carrying out a process for the catalytic partial oxidation of hydrocarbons to a gaseous product in which there is a hydrogen gas yield of about 87% (col. 14, lines 35-38) by reacting the hydrocarbons with an oxidizer gas (col. 6, lines 17-24).

Therefore, it would have been obvious to one of ordinary skill in the art to provide a catalyst comprising an alumina support (col. 8, lines 20-23) and a noble metal impregnated therewith (rhodium and iridium, col. 8, lines 10-15) wherein weight percentage or metal loading of the catalyst is about 20 wt % (col. 8, lines 18-19) wherein a process for the catalytic partial oxidation of hydrocarbons to a gaseous product (col. 6, lines 17-24) in which there is a carbon monoxide gas yield of 95% and a hydrogen gas yield of about 87% (hydrocarbon conversion is at least 85%, col. 14, lines 35-38), is carried out with the afore mentioned catalyst in Hindin et al. in order to

produce a gaseous product which is rich in hydrogen and carbon monoxide by reacting the hydrocarbons with an oxidizer gas (col. 6, lines 17-24) as taught by Anumakonda et al. and for the reasoned explanation that the two catalysts of Hindin et al. and Anumakonda et al., respectively, are drawn to a catalyst with similar properties.

As to the limitation wherein the process under operating conditions of at least greater than or equal to 2 atmospheres, Isogaya et al. teach a process wherein hydrocarbons are reacted with oxidizer in the presence of a catalyst and produce a stream rich in hydrogen and carbon monoxide (col. 1, lines 5-20) operating at a known pressure of from 1 to 100 atmospheres (col. 5, lines 1-3).

Therefore, it would have been obvious to one of ordinary skill in the art to provide operating at a known pressure of from 1 to 100 atmospheres (col. 5, lines 1-3) in Hindin et al. in order to carry out a process wherein hydrocarbons are reacted with oxidizer in the presence of a catalyst and produce a stream rich in hydrogen and carbon monoxide (col. 1, lines 5-20) in a similar process as taught by Isogaya et al.

The combined teachings of Hindin et al., Anumakonda et al., and Isogaya et al. meet the limitation wherein the process exhibits a loss in hydrogen selectivity no greater than about 1 or 3% a day.

Claims 18, and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feeley et al. (U.S. 6447745) in view of Anumakonda et al. (U.S. 6221280) and Hindin et al. (U.S. 3956188).

Feeley et al. teach a process for converting at least a portion of a feedstream comprising a hydrocarbon containing gas and an oxygen containing gas over a catalyst as described in claim 16. Feeley et al. fail to teach characterized by a surface area of at least 20 square meters per gram after calcination at a temperature of 1200°C. Feeley et al. fail to teach a process for producing synthesis gas comprising passing a hydrocarbon gas and an oxygen containing gas over a catalyst, under conditions effective to produce a gas stream comprising hydrogen and carbon monoxide and wherein the catalyst comprises a metal surface area greater than 0.35 m<sup>2</sup>/g of the catalyst. Feeley et al. also fail to teach wherein the process exhibits a hydrocarbon conversion equal to or greater than 80% or 85%, and a hydrogen selectivity to or greater than 80% or 85%, and a hydrogen selectivity equal to or greater than 80%, wherein the process exhibits a loss in hydrogen selectivity no greater than about 1 or 3% per day, under operating conditions of at least greater than or equal to 2 atmospheres.

Anumakonda et al., however, teach a catalyst comprising an alumina support (col. 8, lines 20-23) and a noble metal impregnated therewith (rhodium and iridium, col. 8, lines 10-15) wherein weight percentage or metal loading of the catalyst is about 20 wt % (col. 8, lines 18-19) for the purpose of carrying out a process for the catalytic partial oxidation of hydrocarbons to a gaseous product in which there is a hydrogen gas yield of about 87% (col. 14, lines 35-38) by reacting the hydrocarbons with an oxidizer gas (col. 6, lines 17-24).

Therefore, it would have been obvious to one of ordinary skill in the art to provide a catalyst comprising an alumina support (col. 8, lines 20-23) and a noble metal impregnated therewith (rhodium and iridium, col. 8, lines 10-15) wherein weight percentage or metal loading of the catalyst is about 20 wt % (col. 8, lines 18-19) wherein a process for the catalytic partial oxidation of hydrocarbons to a gaseous product (col. 6, lines 17-24) in which there is a carbon monoxide gas yield of 95% and a hydrogen gas yield of about 87% (hydrocarbon conversion is at least 85%, col. 14, lines 35-38), is carried out with the afore mentioned catalyst in Feeley et al. in order to produce a gaseous product which is rich in hydrogen and carbon monoxide by reacting the hydrocarbons with an oxidizer gas (col. 6, lines 17-24) as taught by Anumakonda et al. and for the reasoned explanation that the two catalysts of Hindin et al. and Anumakonda et al., respectively, are drawn to a catalyst with similar properties.

As to the limitation wherein the alumina support has a surface area of greater than or equal to about 10 m<sup>2</sup>/g after said high temperature treatment, Hindin et al. teach a process for making a catalyst wherein Lanthanum is used as a modifier (col. 4, lines 38-45) for the purpose of obtaining a surface area of at least 20 square meters per gram after calcination at a temperature of 1200°C (col. 1, lines 42-45).

Therefore, it would have been obvious to one of ordinary skill in the art to provide that a catalyst comprising a similar modifier as Lanthanum (col. 4, lines 38-45) in Feeley et al. would result in obtaining a surface area of at least 20 square meters per gram after calcination at a temperature of 1200°C (col. 1, lines 42-45) in a similar catalyst as taught by Hindin et al.



The combined teachings of Feeley et al., Anumakonda et al., and Hindin et al. meet the limitation wherein the process exhibits a loss in hydrogen selectivity no greater than about 1 or 3% a day.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Wartalowicz whose telephone number is (571) 272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Paul Wartalowicz  
January 31, 2006



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